SURFACE VEHICLE RECOMMENDED PRACTICE

J3096™ APR2026

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Cooling System Nonmetallic Caps and Filler Necks - Threaded Construction

RATIONALE

Five-Year Review.

1. SCOPE

This SAE Recommended Practice was developed primarily for passenger car and truck applications but may be used in marine, industrial, and similar applications. It addresses nonmetallic caps and both metallic and nonmetallic filler necks.

1.1 Description

This SAE Recommended Practice specifies requirements for cooling system caps (used for radiator and surge tank fill and pressure relief) having a plastic material construction with threaded attachment. The document includes the corresponding geometry definition for both plastic and metallic filler necks. The primary focus is to assure sealing and thread compatibility between the cap and filler neck while fulfilling the requirements of SAE J164. It should be noted that although this is a common design, there are others used in the industry that are not depicted within this document.

2. REFERENCES

2.1 Applicable Documents

The following publications form a part of this specification to the extent specified herein. Unless otherwise indicated, the latest issue of SAE publications shall apply.

2.1.1 SAE Publications

Available from SAE International, 400 Commonwealth Drive, Warrendale, PA 15096-0001, Tel: 877-606-7323 (U.S. and Canada only) or +1 724-776-4970 (outside U.S. and Canada), www.sae.org.

SAE J164 Cooling System Metallic Caps and Filler Necks

3. DEFINITIONS

3.1 COOLING SYSTEM CAP

Herein referred to as cap, means a device which closes the opening used to add coolant to the pressurized section of the engine cooling system.

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3.2 COOLING SYSTEM FILLER NECK

The filler neck (also radiator, surge tank, or remote fill or filler neck) is the feature to which the cap mates or attaches. Proper function is assured when the dimensional requirements for both the cap and filler neck are met.

3.3 LEGIBLE

This means readable under daylight lighting conditions by an observer with normal vision whose eye point is located in proximity to the marked surface.

4. APPLICATION

This document applies to passenger cars, multipurpose passenger vehicles, trucks, chassis cabs, buses, construction vehicles, and equipment produced for motor vehicles manufactured after the effective date of this document.

5. REQUIREMENTS

5.1 Pressure relief which is actuated without operator action for the purpose of limiting peak pressures in the cooling system should be accomplished in a manner that limits, to the extent practicable, the risk of injury. Pressure relief which is actuated by the operator for the purpose of safe removal of the cap must conform to 5.2 or 5.3, except as provided in 5.4.

5.2 Pressure release mechanism incorporated in the cap and/or filler neck shall conform to one of the following:

5.2.1 If pressure relief can be accomplished by cap rotation, one of the following mechanisms must be incorporated to prevent cap removal prior to pressure relief:

5.2.1.1 Mechanical stop that prevents cap removal by rotation only, requiring the cap to be moved axially and further rotated for removal.

5.2.1.2 A design which requires that the cap be rotated at least one turn before pressure starts to release and at least an additional 1-1/2 turns before the cap can be removed.

5.2.2 If pressure relief is accomplished through other than cap rotation, a means shall be provided to prevent removal of the cap before the pressure relief is actuated.

5.3 Pressure release mechanism not incorporated in the cap and/or filler neck shall have legibly and permanently marked on or adjacent to the cap instructions for relief of system pressure prior to cap removal.

5.4 Sealed cooling system which the manufacturer recommends servicing at stated intervals and which does not meet the requirements of 5.2 and 5.3 shall require use of a tool to accomplish cap removal. The words “Do Not Remove - See Manufacturer’s Instructions” shall be legibly and durably marked on or immediately adjacent to the cap.

5.5 The cap assembly shall be legibly and durably marked with its normal pressure rating and notation “Warning Do Not Remove Hot.” Manufacturers may also elect to use ISO symbols to replace the verbiage, thus avoiding issues with language.

5.6 Cap Functional Overview (see Figure 1)

The area between the two O-rings is open to the atmosphere. This passage may be connected to a drain channel, a surge tank overflow fitting, or a radiator fitting which connects to the overflow bottle. As the cap is rotated OFF, pressure is relieved through this passage. Likewise, when cap pressure is exceeded, the pressure is relieved by lifting the PRESSURE RELIEF VALVE off of its seal. Fluid (coolant or air) return occurs during cooldown as negative pressure lifts the VACUUM VALVE off its sealing surface, allowing fluid to be drawn from either the atmosphere or the overflow bottle back into the cooling system.

Documents
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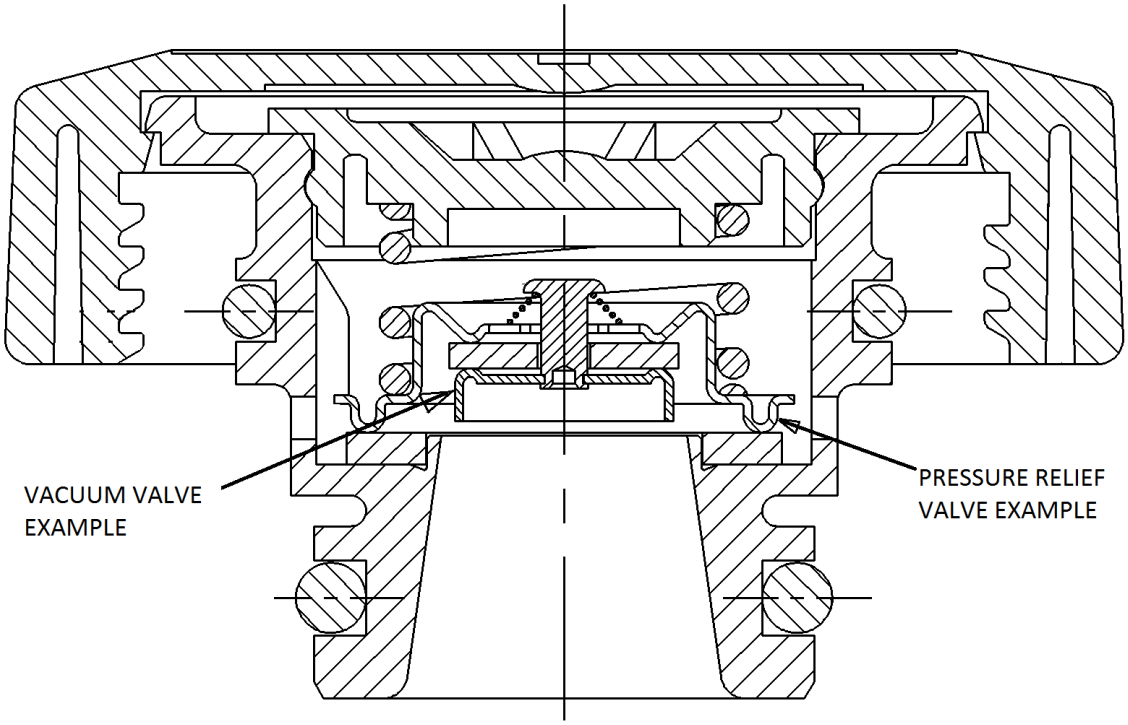


Figure 1 - Section view of typical pressure cap

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